

1 WHAT IS CLAIMED IS:

1 1. An apparatus for executing a block program comprising:  
2 a block table listing a plurality of records corresponding to a plurality of  
3 blocks in the block program;  
4 a block library for holding a plurality of algorithms associated with said  
5 blocks; and,  
6 means for executing said blocks in said block program in accordance with  
7 said associated algorithms;  
8 wherein said executing means selectively executes said blocks in the  
9 block program that receives a new input value which is different from a previous input  
10 value.

1 2. The apparatus as defined in claim 1 further including an execution  
2 image file for storing descriptions of said blocks and connections between said blocks.

1 3. The apparatus as defined in claim 1 further including means for  
2 inputting/outputting data to and from said executing means.

1 4. The apparatus as defined in claim 1 wherein each of said records in  
2 said block table includes a field indicating whether a corresponding one of said blocks is  
3 to be executed by said executing means.

1 5. The apparatus as defined in claim 4 wherein each of said records in  
2 said block table further includes,  
3 a field for indicating the type of function performed by said corresponding  
4 one of said blocks, and  
5 a field for identifying said corresponding one of said blocks.

1 6. The apparatus as defined in claim 5 wherein each of said records in  
2 said block table further includes,  
3 at least one field for identifying at least one output connector connected to  
4 said corresponding one of said blocks,

at least one field for identifying at least one input connector connected to said corresponding one of said blocks,  
at least one field for storing an input value of said corresponding one of said blocks, and  
an output value field for storing an output value of said corresponding one of said blocks.

7. The apparatus as defined in claim 1 further including a connector table listing a plurality of records of a plurality of connectors for operatively connecting said blocks.

8. The apparatus as defined in claim 7 wherein each of said records in said connector table includes a field identifying one of said blocks to which a corresponding connector is connected at a first end, and at least one field for identifying at least one of said blocks to which said corresponding connector is connected at at least one second end.

9. A method for executing a block program comprising the steps of:  
creating a block table of plurality of block records that correspond to a plurality of blocks used in the block program;  
creating a library for holding a plurality of algorithms for executing functions associated with said blocks;  
selectively setting a flag in said block records when at least one input value of corresponding said blocks changes; and  
executing said algorithms of said blocks in said block program having corresponding block records that have said flag set.

10. The method as defined in claim 9 further including the step of creating a connector table of records that correspond to connectors for operatively connecting said blocks.

11. The method as defined in claim 10 further including the step of subsequently setting a flag in said records corresponding to said blocks that are

3 connected to at least one output of said blocks that have been executed, if a value of  
4 said at least one output of said executed blocks has changed.

1 12. The method as defined in claim 11 wherein said step of  
2 subsequently setting said flag includes the steps of obtaining an identification of a  
3 connector corresponding to said at least one output of said executed blocks from said  
4 block records corresponding to said executed blocks, and obtaining an identification of  
5 blocks that are connected to said connector.

1 13. The method as defined in claim 10, wherein said block table and  
2 said connector tables are created from an execution image file storing said records for  
3 said blocks and said connectors.

1 14. The method as defined in claim 9 wherein said executing step is  
2 performed at every predetermined time interval.

1 15. The method as defined in claim 9 wherein said records in said block  
2 table are listed in an order corresponding to a predetermined order in which said blocks  
3 are adapted to be executed in said block program.

1 16. The method as defined in claim 15 wherein said executing step  
2 includes a step of checking each record in said block table in said listed order for said  
3 block records having said flag set.

1 17. A controller having a block program for controlling at least one  
2 device in a control network, comprising:

3 a block table listing a plurality of records corresponding to a plurality of  
4 function blocks in the block program, said blocks each having at least one input for  
5 receiving an input value and at least one output for outputting an output value;

6 a connector table listing records of connectors for operatively connecting  
7 said blocks;

8 a block library for holding algorithms associated with said blocks; and,  
9 means for executing said blocks in said block program in accordance with  
10 said associated algorithms;  
11 wherein said executing means selectively executes said blocks in the  
12 block program that receives a new input value which is different from a previous input  
13 value.

1 18. The controller as defined in claim 17 further including means for  
2 inputting data to said executing means from the devices and the control network, and  
3 outputting data to the devices and the control network from said executing means.